



US Army Corps
Of Engineers
Wilmington District

PUBLIC NOTICE

Issue Date: March 3, 2006
Comment Deadline: April 3, 2006
Corps Action ID No. 200600366

All interested parties are hereby advised that the Wilmington District, Corps of Engineers (Corps) has received an application for work within jurisdictional waters of the United States. Specific plans and location information are described below and shown on the attached plans. This Public Notice and all attached plans are also available on the Wilmington District Web Site at www.saw.usace.army.mil/wetlands

Applicant: Red Apple Group, LLC
Attn: J. R. Triplett
Post Office Box 689
Shallotte, North Carolina 28459

AGENT (if applicable): Charles F. Riggs
Charles F. Riggs and Associates, Inc.
202 Warlick Street
Jacksonville, North Carolina 28541

Authority

The Corps will evaluate this application and decide whether to issue, conditionally issue, or deny the proposed work pursuant to applicable procedures of Section 404 of the Clean Water Act.

Location

The proposed Peninsula at Topsail Island Subdivision project site is 8.8 acres in size and is located adjacent to the Intracoastal Waterway, at the end of Atkinson Road, off NC Highway 50, approximately 1.6 miles south of the traffic light at the intersection of NC Highway 210 and 50, in Surf City, Pender County, North Carolina. (34.4149 N, 77.5672 W)

(Attachment A)

Existing Site Conditions

The property is a peninsula of land extending into the inter-tidal marsh area of Topsail Sound, which consists of 4.016 acres of uplands, 1.904 acres of delineated Section 404 Wetlands, and 0.921 acres of delineated Coastal Wetlands. Man-made canals averaging approximately 50-60 feet in width border the property to the north and south. Approximately 2 acres of the recorded tract is below the normal high water line of the adjacent man-made canals. The western tip of the peninsula is bordered by Topsail Sound and the landward (eastern) end of the property is bordered by an existing residential subdivision. The site is currently undeveloped.

The North Carolina Division of Water Quality classifies the waters of Topsail Sound and the man-made canals, in the vicinity of the project area, as "SA". The area is not designated as a Primary Nursery Area by the North Carolina Division of Marine Fisheries and is open to the harvesting of shellfish.

The peninsula was created, between the late 1960s and early 1970s, by excavating two canals through marsh and discharging the excavated material within the marsh area between the two canals. The canals were constructed under a permit from the U.S. Army Corps of Engineers (Corps) issued on May 6, 1969 (AID 196900042), and from the State of North Carolina's Division of Coastal Management in 1970. The Corp's permit expired on December 31, 1972. Based on the review of the Division of Coastal Management's file records, the State permit was renewed in December of 1971 and reviewed again in February 1973 for a second renewal. Correspondence from the Division of Commercial and Sports Fisheries, dated November 6, 1973, stated, "Since the original overall project involved considerable additional fill being placed in important marsh species, the renewal was objected to by the Division and was denied in February 1973". This permit denial in 1973 appears to be the reason the center of the peninsula was not filled and remains as §404 Wetlands today. This area, although vegetated with coastal wetland species, is not considered coastal wetlands by the Division of Coastal Management. This is due to the fact that the center portion of the peninsula, having been cut off by deposition of excavated material, is no longer under tidal influence. However, the Corps of Engineers has exerted jurisdiction over the wetlands in the interior of the tract. A copy of the approved wetland delineation, signed by the Corps is included with this public notice as Attachment B.

Applicant's Stated Purpose

The applicant's purpose for this project is to develop a 37 lot residential subdivision. (Attachment C)

Project Description

The following is a brief history of past permit activities at this site. In 1989, Ruth A. King filed an application for a CAMA Major Permit and a Corps Regional General Permit, requesting authorization to bulkhead the perimeter of the property and to fill the entire tract, raising the elevation by 2 feet. The application requested permission to fill approximately two acres of wetlands in the center of the peninsula. The §401 Water Quality Certification and CAMA Permit were subsequently denied. As a result of the State's denial, the Corps denied the

application without prejudice on October 11, 1990 (AID 19900428). Ms. King reapplied after making modifications to her proposal, and in November 1991, CAMA Major Permit #142-91 was issued to Ms. King conditional upon the applicant receiving all required permits and approvals, including a §401 Water Quality Certification. The Division of Water Quality later denied the Certification, and accordingly, the Corps denial without prejudice remained. Mrs. King filed a takings claim against both the Environmental Management Commission and the Coastal Resources Commission. The claim was based on: (1) the EMC's denial of her application for a §401 Water Quality Certification to fill wetlands for the purposes of constructing an access road for a residential subdivision; and (2) the CRC's issuance of a CAMA Permit for the project that was conditioned on Mrs. King obtaining the §401 Certification prior to construction. By an order dated of June 6, 1997, the North Carolina Supreme Court denied Ruth King's petition for discretionary review. The Court of Appeals upheld the summary judgment in favor of the State agencies on Mrs. King's takings claim.

On February 3, 1999, Mrs. King's son, Mr. Walter A. Warren, filed an application for a CAMA Major Permit and a Corps Regional General Permit for the development of the eight-acre tract of land into a 46-lot residential subdivision. This proposal included the filling of approximately 0.39 acres of §404 Wetlands within the center of the property for access road and driveway construction. The Division of Coastal Management's State Permit No. 129-99 was issued on December 22, 1999, authorizing the development as proposed. The North Carolina Division of Water Quality issued Water Quality Certification No. 990169 for the project on September 13, 1999, and the Corps authorized the project issuing GP 198000291 on February 11, 2000 (AID 199900928). In accordance with the conditions of the Water Quality Certification, State Permit No. 129-99 required that a conservation easement be placed on all lots with remaining jurisdictional wetlands and waters preventing future wetland impacts. The permit required that these mechanisms be put in place within 30 days of the issuance of the permit. This permit was renewed by the State on October 29, 2002 and by the Corps on November 8, 2002. Both Federal and State permits expired on December 31, 2004.

In February 2000, a one-lane gravel access road measuring approximately 10 feet in width was constructed on the property, resulting in the filling of a portion of the §404 Wetlands authorized for fill. The property was sold to the Red Apple Group, LLC on July 27, 2004. On August 27, 2004, the North Carolina Division of Water Quality issued a Notice of Violation to Red Apple Group, LLC and to Mr. Walter A. Warren for the failure to comply with the conditions of the §401 Water Quality Certification dated September 13, 1999, which required that a conservation easement to be placed on the property within 30 days of the date of the §404 Permit, issued by the U.S. Army Corps of Engineers. On May 11, 2005, the Division of Coastal Management received an application from Red Apple Group, LLC for the development of the subject property. On June 6, 2005, the Division of Coastal Management issued a Notice of Violation to Mr. Walter A. Warren for violating the terms and conditions of State Permit No. 129-99, for the failure to record conservation easements on all lots with remaining jurisdictional wetlands and waters and for the construction of the gravel road approximately 10-15 feet northeast of the permitted alignment. On June 10, 2005, a letter was sent to Red Apple Group, LLC's agent, Charles Riggs, notifying him that the permit application, received on May 11, 2005, would not be processed until the Notice of Violation was resolved. After consultation with the U.S. Army Corps of Engineers and the North Carolina Division of Water Quality, it was determined that the

removal of the gravel road way and wetland fill would be sufficient for resolving the Notice of Violation. Red Apple Group, LLC in early August 2005, removed the gravel road and wetland fill.

Currently, the Red Apple Group has applied for a Department of the Army permit to fill in all remaining Section 404 Wetlands (1.904 acres) for the construction of a street, sidewalks, utility lines, and lots for the proposed subdivision. To mitigate for the proposed wetland impacts, the applicant is proposing to restore/create approximately 1.992 acres of wetlands along the perimeter of the peninsula between the proposed dwellings and the coastal wetland line. The figures in the proposed compensatory mitigation plan (Attachment D), is inconsistent with those in the permit application.

The Red Apple Group has chosen to leave it up to future homeowners to obtain separate permits for individual docks and bulkheads, and therefore has not included these potential impacts in this permit application.

Other Required Authorizations

This notice and all applicable application materials are being forwarded to the appropriate State agencies for review. The Corps will generally not make a final permit decision until the North Carolina Division of Water Quality (NCDWQ) issues, denies, or waives State certification required by Section 401 of the Clean Water Act (PL 92-500). The receipt of the application and this public notice in the NCDWQ Central Office in Raleigh serves as application to the NCDWQ for certification. A waiver will be deemed to occur if the NCDWQ fails to act on this request for certification within sixty days of the date of the receipt of this notice in the NCDWQ Central Office. Additional information regarding the Clean Water Act certification may be reviewed at the NCDWQ Central Office, 2321 Crabtree Boulevard, Raleigh, North Carolina 27604-2260. All persons desiring to make comments regarding the application for certification under Section 401 of the Clean Water Act should do so in writing delivered to the North Carolina Division of Water Quality (NCDWQ), 2321 Crabtree Boulevard, Suite 250, Raleigh, North Carolina 27609-2260 Attention: Ms. Cyndi Karoly by March 27, 2006.

The applicant has not provided to the Corps, a certification statement that his/her proposed activity complies with and will be conducted in a manner that is consistent with the approved North Carolina Coastal Zone Management Program. Pursuant to 33 CFR 325.2(b)(2), the Corps can not issue a permit for the proposed work until the applicant submits such a certification to the Corps and the North Carolina Division of Coastal Management (NCDCM), and the NCDCM notifies the Corps that it concurs with the applicant's consistency certification.

Essential Fish Habitat

This notice initiates the Essential Fish Habitat (EFH) consultation requirements of the Magnuson-Stevens Fishery Conservation and Management Act. The Corps' initial determination is that the proposed project will not adversely impact EFH or associated fisheries managed by the South Atlantic or Mid Atlantic Fishery Management Councils or the National Marine Fisheries Service.

Cultural Resources

The Corps has consulted the latest published version of the National Register of Historic Places and is not aware that any registered properties, or properties listed as being eligible for inclusion therein are located within the project area or will be affected by the proposed work. Presently, unknown archeological, scientific, prehistoric, or historical data may be located within the project area and/or could be affected by the proposed work.

Endangered Species

The Corps has reviewed the project area, examined all information provided by the applicant and consulted the latest North Carolina Natural Heritage Database. Based on available information, the Corps has determined pursuant to the Endangered Species Act of 1973, that the proposed project will have no effect on federally listed endangered or threatened species or their formally designated critical habitat.

Evaluation

The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit, which reasonably may be expected to accrue from the proposal, must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, flood plain values (in accordance with Executive Order 11988), land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and, in general, the needs and welfare of the people. For activities involving the discharge of dredged or fill materials in waters of the United States, the evaluation of the impact of the activity on the public interest will include application of the Environmental Protection Agency's 404(b)(1) guidelines.

Commenting Information

The Corps is soliciting comments from the public; Federal, State and local agencies and officials, including any consolidate State Viewpoint or written position of the Governor; Indian Tribes and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment (EA) and/or an Environmental Impact Statement (EIS) pursuant to the National Environmental Policy Act (NEPA). Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider the application. Requests for public hearings shall state, with particularity, the reasons for holding a public hearing. Requests for a public hearing shall be granted, unless the District Engineer determines that the issues raised are insubstantial or there is otherwise no valid interest to be served by a hearing.

Written comments pertinent to the proposed work, as outlined above, will be received by the Corps of Engineers, Wilmington District, until 5pm, April 3, 2006. Comments should be submitted in writing to Lillette Granade, delivered to 69 Darlington Avenue, Wilmington, North Carolina 28402. Ms. Granade may be contacted at (910) 251-4829.



[illegible]

- 1) DESTROY ALL UTILITY EXISTENT FOR TOWN OF SLAT CITY
- 2) DESTROY ALL UTILITY EXISTENT FOR PRIVATE RLY OF WATER & AIRBORNE ROAD
- 3) ALL DRINKS ARE PERMISSIBLE MATERIAL.
- 4) EACH LOT IS SUBJECT TO A 5' DRAINAGE & UTILITY EXISTENT ALONG THE FRONT OF THE LOT
- 5) LOCATION OF DESTROYING TREES AS SHOWN
- 6) 5' CONCRETE WALK ALONG WESTERN SIDE OF STREET TO BE
- 7) PROPOSED WATER MAIN IS 6" AND TIED TO EXISTING 6" MAIN
- 8) TWO FIRE HYDRANTS PROPOSED AS SHOWN
- 9) 404' WALK DETAILMENT WAS APPROVED BY
- 10) U.S. MARCY CORPS OF ENGINEERS ON NOVEMBER 11, 2004
- 11) CONSTRUCTION BEHAVIOR WAS APPROVED BY
- 12) DISTRICT OF CALIFORNIA MANAGEMENT ON OCTOBER 12, 2004

CHARLES F. RIGGS & ASSOCIATES, INC.

LAND PLANNING & COMPUTER MAPPING

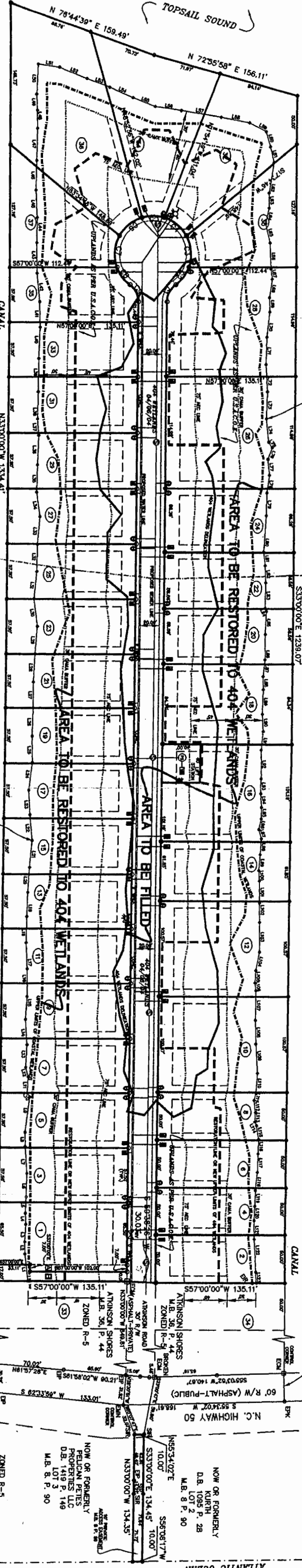
202 WARLICK STREET
P.O. BOX 1570
JACKSONVILLE, N.C. 28541-1570
TELEPHONE: (910) 455-0877
FACSIMILE: (910) 455-9035
E-MAIL: figajalind@bizee.it.com

NORMAL HIGH WATER		
LINE TABLE		
LINE	SECTION	READING
L1	28.20	13.53
L2	12.71	13.53
L3	16.51	13.53
L4	11.67	13.53
L5	17.35	13.53
L6	24.79	13.53
L7	27.69	13.53
L8	15.41	13.53
L9	37.10	13.53
L10	4.72	13.53
L11	11.31	13.53
L12	23.60	13.53
L13	26.66	13.53
L14	25.61	13.53
L15	28.66	13.53
L16	28.66	13.53
L17	27.60	13.53
L18	28.25	13.53
L19	28.12	13.53
L20	28.51	13.53
L21	27.25	13.53
L22	26.81	13.53
L23	28.11	13.53
L24	28.11	13.53
L25	28.11	13.53
L26	28.11	13.53
L27	27.68	13.53
L28	28.64	13.53
L29	28.64	13.53
L30	28.25	13.53
L31	28.25	13.53
L32	28.46	13.53
L33	28.67	13.53
L34	28.67	13.53
L35	28.46	13.53
L36	28.46	13.53

NORMAL HIGH WATER	
LINE 170-SE	
L46	14.00
L47	14.00
L48	14.00
L49	14.00
L50	14.00
L51	14.00
L52	14.00
L53	14.00
L54	14.00
L55	14.00
L56	14.00
L57	14.00
L58	14.00
L59	14.00
L60	14.00
L61	14.00
L62	14.00
L63	14.00
L64	14.00
L65	14.00
L66	14.00
L67	14.00
L68	14.00
L69	14.00
L70	14.00

NORMAL HIGH WATER		
LINE TABLE		
LINE	LENGTH	BEARING
L76	26.53	S81°45'E15.1
L77	28.33	S88°10'W1.1
L78	26.67	S89°55'W1.1
L79	24.50	S89°55'W1.1
L74	24.50	S89°55'W1.1
L75	6.56	S80°13'W1.1
L76	12.76	S102°44'E1.1
L77	18.35	S90°00'W1.1
L78	23.60	S120°05'W1.1
L79	23.60	S120°05'W1.1
L80	14.75	S89°23'W1.1
L81	14.75	S89°23'W1.1
L82	27.18	S89°14'W1.1
L83	28.14	S89°56'W1.1
L84	15.3	S89°56'W1.1
L85	24.54	S91°22'E1.1
L86	26.74	S91°22'E1.1
L87	17.87	S88°34'W1.1
L88	13.81	S84°34'W1.1
L89	24.94	S91°13'W1.1
L90	24.94	S91°13'W1.1
L91	18.85	S86°55'W1.1
L92	30.35	S84°51'W1.1
L93	15.85	S91°39'W1.1
L94	13.85	S91°39'W1.1
L95	11.88	S82°10'W1.1
L96	8.32	S82°10'W1.1
L97	18.32	S82°10'W1.1
L98	18.18	S84°10'W1.1
L99	11.32	S123°25'E1.1
L100	23.10	S124°05'E1.1
L101	23.10	S124°05'E1.1
L102	20.47	S133°07'E1.1
L103	31.52	S133°08'E1.1
L104	18.42	S27°20'W1.1
L105	13.24	S30°30'W1.1

LINE TABLE		
LINE	LENGTH	BEARING
1101	6.73	S64°04'E 0.01
1102	6.73	S64°04'E 0.01
1103	24.64	S34°55'E 0.01
1104	30.78	S36°52'E 0.1
1105	20.81	S50°12'E 0.1
1106	6.27	S51°43'E 0.1
1112	12.95	S59°47'E 0.1
1113	9.58	S51°05'E 0.1
1114	1.35	S59°01'E 0.1
1115	11.37	S51°31'E 0.01
1116	15.37	S30°13'E 0.01
1117	18.38	S30°13'E 0.01
1118	10.38	S24°02'E 0.1
1119	17.32	S23°00'E 0.1
1120	14.74	S26°32'E 0.1
1121	18.61	S45°21'E 0.1
1122	33.67	S55°38'E 0.01
1123	11.59	S55°38'E 0.1



SITE CALCULATIONS:
 TOTAL ACREAGE: 8.649 ACRES
 TOTAL AVERAGE TO BE SUBDIVIDED: 8.649 ACRES
 TOTAL AVERAGE TO BE RESERVING: 1.000 ACRES
 TOTAL AVERAGE TO BE NONRESERVING: 0.000 ACRES (PARK)
 NUMBER OF LOTS: 37
 SIZE OF LOTS: 7,768 S.F. AVERAGE (3,000 S.F. MINIMUM REQUIRED)
 PROPOSED STREET WIDTH: 20' SMALL (10' SIDE ALLEYS)
 PROPOSED RIGHT-OF-WAY WIDTH: 30'
 PROPOSED LENGTH OF STREET: 107'

EXISTING 404 WETLANDS:	82974 Sq.Ft. 1.904 ACRES
PROPOSED 404 WETLANDS UPON COMPLETION OF DEVELOPMENT:	86784 Sq.Ft. 1.993 ACRES

**86784 Sq.Ft.
1.992 ACRES**

PRELIMINARY PLAT OF
THE PENINSULA AT TOPSAIL ISLAND

PRELIMINARY PLAT OF
PENINSULA AT TOPSAIL ISLAND
8.849 ACRE TRACT ON WALTER R. ATKINSON ROAD
TOPSAIL TOWNSHIP, PENDER COUNTY, NORTH CAROLINA
TOWN OF SUDBURY CITY

(IN FEET)
1 inch = 100 ft.

GRAPHIC SCALE

REVISION: WETLANDS 04/06/04
DATE: OCTOBER 28, 2004
DRAWN BY: J. HELMS
FIELD BOOK: ND
CHECKED BY: _____
PAGE: 42
COMPUTER: MSE\PROJ\020322CAMA.dwg
PROJECT NUMBER: 02-03-22M3

[F]

ADAM APPLE GROUP, ILC
P.O. BOX 688
SHALLOTTE, NC 28459

TITLE SOURCE
D.R. 2429, P. 264

REFERENCES:
D.R. 214, P. 78
D.R. 383, P. 368
D.R. 473, P. 189
D.R. 613, P. 87
D.R. 993, P. 333
D.R. 1095, P. 28
D.R. 1418, P. 149
D.R. 1559, P. 195
D.R. 1867, P. 210
D.R. 2429, P. 264
M.B. 8, P. 90
M.B. 36, P. 44

400

ZONING SETBACKS
FRONT = 15'
SIDE = 7.5'
REAR = 30' CAMA

8.849 ACRES
INCLUDING THE
AREA BELOW
THE APPROXIMATE
MEAN HIGH
WATER LINE

HOW OR FORMERLY
 PELICAN PETES
 PROPERTIES LLC
 D.B. 1419 P. 149
 LOT 3
 M.B. & P. 90

KURTH
D.B. 1095 P. 2B
LOT 2
M.B. 8 P. 90
S56°08' E 10.00'
S53°02' E 10.00'
S33°00'00" E 134.45' 10.0
44° EP 38 SR 744 7.17
N33°00'00" W 134.35'

NOW OR FORMERLY



Attachment C

SHEET: 54 OF 64

Land Management Group, Inc.
Environmental Consultants

MAILING ADDRESS:
P.O. Box 2522
Wilmington, N.C. 28402

SHIPPING ADDRESS:
3805 Wrightsville Ave., #14
Wilmington, N.C. 28403

TELEPHONE:
office (910) 452-0001
fax (910) 452-0060

RECEIVED

FEB - 6 2006

REGULATORY
WILM. FLD. OFC.

THE PENINSULA AT TOPSAIL ISLAND
COMPENSATORY MITIGATION PLAN

Existing Wetlands:

Wetlands occurring on the property have been historically impacted via dredging and disposal activities. In 1970, a US Army Corps of Engineers (USACE) dredge and fill permit authorized the excavation of two large canals extending perpendicular from the Atlantic Intracoastal Waterway (AIWW) along the northeast and southwest property lines. Disposal material from the excavation was side-cast into the adjacent area. This served to alter the elevation of the immediate area as well as hydrologically disconnect interior wetlands pockets from the fringe coastal marsh. Coastal marsh wetlands (as defined by NC Division of Coastal Management regulations) continue to occur adjacent to the open water canals. Interior of the coastal marsh is an area of contiguous uplands extending around the perimeter of the property. Section 404 wetlands occur within the interior portion of the property. These wetlands areas are not inundated by regular or occasional tides, but have retained the hydrology and vegetation sufficient to be delineated as Section 404 wetlands. The dominant species occurring in these areas is *Phragmites australis* - a species indicative of site disturbance. Other species occurring in these areas include *Spartina patens*, *Typha latifolia*, *Polygonum* spp., and *Juncus effusus*. Wetland areas have been historically impacted by site activities and characteristic functions of the coastal marsh have been compromised.

Typical functions associated with natural, relatively undisturbed coastal marsh systems include high primary productivity, detrital export, and feeding and refuge habitat for benthic and aquatic species. Based upon the level of disturbance that has already occurred on the site, it is apparent that the interior pocket wetlands do not provide quality habitat for characteristic estuarine fauna. In addition, the lack of a regular tidal connection, severely limits and/or removes the detrital export function. These wetland areas do still provide some level of primary productivity and likely serve as nutrient sinks.

Impact Summary:

Approximately 1.55 ac of Section 404 wetlands will be impacted by the proposed activities (i.e. access road, driveway crossings, and sidewalks). Areas of proposed impact have been historically altered via dredge and fill activities resulting in sub-functional wetland areas. Refer to the submitted CAMA Major Permit application and associated drawings for more detailed information related to proposed wetland disturbances.

Attachment D

Proposed Mitigation:

The applicant proposes to restore coastal wetlands on-site via the removal of upland berms occurring along the perimeter of the property. Approximately 1.64 ac of coastal high marsh will be restored (corresponding to a slightly greater than 1:1 compensatory mitigation ratio). As identified above, the upland berms are the result of historic fill (sidecast) material from the excavation of the adjacent canals. These areas are of slightly higher topography and restrict tidal inundation. Mitigation efforts will include the excavation and grading of these areas to elevations consistent with the adjacent coastal high marsh. Based upon surveyed elevations of existing high marsh, the final grades of the restoration area will range between 2.5-ft and 3.0-ft NGVD 29. Refer to the site plan provided in the permit application depicting the plan view and cross-sectional view of the proposed mitigation area.

The restoration is intended to restore high marsh (i.e. coastal wetlands located above normal high water). As such, the target vegetative community will consist of *Spartina patens*, *Distichlis spicata*, *Juncus roemerianus*, *S. cynosuroides*, *Iva frutescens*, and *Borrichia frutescens*. Approximately 1.64 ac of former coastal marsh areas will be restored via the re-establishment of tidal hydrology and characteristic high marsh vegetation. While it is expected that characteristic marsh vegetation will recruit naturally into the restored area, the applicant is proposing to plant herbaceous seedlings on 2-ft centers. This will correspond to the planting of approximately 18,000 seedlings. In addition, shrub species (e.g. *I. frutescens* and *B. frutescens*) will be planted on 8-ft centers around the perimeter of the restoration area.

Site Performance Monitoring:

Performance Criteria: Site success criteria are used to evaluate the development of a created or restored wetland in relation to stated project goals and objectives. Monitoring of biological (i.e. vegetation growth) and physical parameters (i.e. hydrology) will help demonstrate the relative success of the marsh restoration site.

Since this compensation project seeks to restore marsh habitat through plantings of nursery stock marsh seedlings, the primary success criteria will be:

- (1) "Demonstrated survival rate of plantings and naturally colonized individuals to meet or exceed 75%," and
- (2) "Vegetative density of the restoration marsh to meet or exceed 75% of the density of the reference marsh."

The Braun-Blanquet (B-B) Method (Braun-Blanquet 1965) will be used to determine the frequency of occurrence (i.e. survival), abundance, and density of vegetation within the restored marsh and the reference site. The USCOE and National Marine Fisheries Service (NMFS) have utilized this method and recommend it as a means of documenting marsh mitigation success. The B-B method prescribes scale values corresponding to variations in percent vegetative cover in a designated quadrat (e.g. one meter-square). From a survey of randomly selected quadrats, frequency of occurrence, abundance, and density can be calculated as follows:

- (1) Frequency of Occurrence = number of occupied quadrats / total number of quadrats,
- (2) Abundance = sum of B-B scale values / number of occupied quadrats, and
- (3) Density = sum of B-B scale values / total number of quadrats.

The hydrologic regime of the restoration zones will mimic that of the selected reference marsh. The high marsh zone will experience soil saturation in the upper 12 inches of substrate and be periodically inundated during storm tides (mimicking natural high marsh habitat).

Monitoring Plan: Monitoring of the restoration area will be conducted near the end of each growing season (September or October) to evaluate annual progress of the restoration effort. Natural marsh stands located adjacent to the proposed mitigation area will also be monitored to provide reference data. Planting densities will be calculated based on percent cover within one meter-square quadrats according to the B-B method. Meter-square quadrat sampling will be conducted via stratified random sampling techniques in both the restored and the reference areas.

Hydrology will be monitored each half-hour through the use of automated peizometers. Three peizometers will be installed in the restored marsh and two in the reference marsh. Hydrographs depicting the frequency and duration of inundation and/or soil saturation will be prepared for each planting zone/habitat type.

Annual monitoring reports will be prepared and submitted for agency review each year for up to 5 years post restoration. Each report will provide qualitative and quantitative information regarding the development of the site and will include an evaluation of the restored area relative to the conditions of the natural reference marsh. If at the end of the 3-year monitoring period annual site success criteria have been met, then no further monitoring will be conducted. If the site fails to meet the stated performance criteria, maintenance contingency measures (e.g. supplemental planting and/or *Phragmites* growth control) will be implemented to rectify site deficiencies. Monitoring would then continue to the point at which reviewing agencies deem the site successful.